Heat recovery unit series

maxi flat 450 - 200

Installation and maintenance

Operating Instructions

Please keep careful!

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ADVANCED SETUP TAC4 DG

Appendix 2:
ADVANCED SETUP on the screens of remote graphic control GRC

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Attachments:
Technical Data maxi flat 450
Technical Data maxi flat 600
Technical Data maxi flat 1000
Technical Data maxi flat 1600
Technical Data maxi flat 2000
Check List A Maintenance Works of the User
Check List B Maintenance Works of qualified Personnel
Air Flow Report
Commissioning and Handover Certificate
CE Declaration of Conformity maxi flat 450 – maxi flat 2000

0 Preamble

PLEASE READ THIS MANUAL CAREFULLY BEFORE INASTALLATION AND COMMISSONING!
THIS MANUAL HAS BEEN MADE WITH GREATEST CARE.
HOWEVER, NO RIGHTS CAN BE DERIVED THEREFROM. WE RESERVE THE RIGHT AT ANY TIME TO PARTIALLY OR ENTIRELY CHANGE THE CONTENT OF THIS MANUAL WITHOUT PRIOR NOTICE.

This manual contains all the best for an assembly plant and a heat recovery unit (HRU) necessary information.
The manual also serves as a handbook for installation, maintenance and customer service work. We recommend that any intervention in the appliance installation company should be consulted.

Subject of this operating manual is the heat recovery unit series maxi flat in different design variants. Possible accessories are only described insofar as it is necessary for the appropriate operation. Please see the particular manuals for further information on accessories.

If you have any questions that have not been answered or have not been sufficiently answered in this documentation, please contact the company Paul Wärmerückgewinnung GmbH. We will be glad to help you.

1 Introduction

1.1 Warranty and Liability

1.1.1 General Information

Our “general terms and conditions“ apply for the maxi flat in the currently valid version. The warranty is aligned with the warranty terms of the manufacturer. This applies to mere replacement of the material and does not include the services. They apply only in case of proof of the performed maintenance according to our regulations by a skilled installer.

1.1.2 Warrant Terms

The warranty period for our MVHR devices is two years as of delivery from our factory. Warranty claims can be asserted exclusively for material and/or construction defects, which occurred during the warranty period. In the event of a warranty claim, the maxi flat may not be demounted without prior permission of the manufacturer in writing. The manufacturer grants the warranty for spare parts only when they were installed by a skilled installer.

The warranty shall expire once/ when:

- the warranty period has elapsed;
- the device is operated without original Paul-filters;
- parts are installed which were not delivered by the manufacturer;
- the device is improperly used;
- the defects occur due to incorrect connection, improper use or soiling of the system;
- unauthorised changes or modifications on the plant are made.
- The data control sheet (see Appendix) was not completed properly and in case of damage is not available.

1.1.3 Conformity

CE, under formal condition that the final product integration is made in conformity with the applicable standards.

1.1.4 Liability

The maxi flat device was developed and manufactured for use in so-called comfort ventilation systems. Any other use is considered as “improper use” and can result in damages to the maxi flat device or in

personal injuries, for which the manufacturer cannot be made liable. The manufacturer is not liable for any damage, which is due to the following causes:

- Non-observance of the notes on safety, operation and maintenance, stated in this manual;
- The installation was not performed according to the regulations;
- Mounting of the spare parts, which were not delivered and prescribed by the manufacturer;
- The defects occur due to incorrect connection, improper use or soiling of the system;
- The warranty period has elapsed;
- Normal wear.

1.2 Safety

Please always observe the safety instructions in this operating manual. The non-observance of the safety instructions, warning notices, notes and instructions can lead to injuries or damages to the maxi flat.

- Unless otherwise stated in this operating manual, only an authorised installer is entitled to install, connect, put into operation and maintain the maxi flat;
- The installation of the maxi flat is to be performed according to the general local building, safety and installation instructions of the corresponding local authorities, of the water works and electric works and other official regulations and directives;
- Always follow the safety instructions, warning notices, notes and instructions described in this operating manual;
- Please keep this manual during the complete life time of the maxi flat in proximity to the device;
- The instructions for the regular replacement of the filters or the cleaning of the supply and exhaust air valves are to be strictly followed;
- The specifications stated in this document may not be changed;
- Any modification of the maxi flat is prohibited;
- In order to guarantee that the device will be regularly controlled, it is recommended to conclude a maintenance contract. Your supplier can give you the addresses of authorised installers in your area.

1.2.1 Used Symbols

The following symbols are used in this manual:

Caution, special note!

Risk of: ***- injury of the user or the installer***
- damages to the device
- impairment of the operation of the device if the instructions are not carried out properly

2 GENERAL MAINTENANCE INSTRUCTIONS

2.1 Construction characteristics

The panels are 30mm double skin steel plates insulated. The outside panels are 0,8mm thick pre-painted (5µm primer + 20µm polyester) gray RAL 9002 color, covered with a plastic protection (to be removed after installation). The inside panel is 0,8mm galvanized steel. This combination allows the exposure of the panels to outdoors conditions, and forms a rigid structure. Thermal insulation is carried out by foam panels, self-extinguishing (M1 class), in conformity with the European environment standards, inserted between layers.

The maxi flat is mono-structured.

Air tightness:

Internal: Class 1 as per EN 13141-7.

External: Class 2 as per EN 13141-7.

2.2 TAC technology fans

The maxi flat series is equipped with TAC technology centrifugal ventilators. The TAC4 DG control is specifically developed to take advantage of this technology. Verify that the supplied voltage corresponds to the specification of the ventilators and that the connection is made according to the supplied wiring instructions

The starting up / stopping of the unit must be activated by using the softstop function on K1/K2/K3 or via the RC/GRC/MODBUS, and not by shutting off the power supply.

Always check the following electrical specifications:

Power supply voltage: 230VAC (210V<V<250V).

Power supply frequency: 50/60 Hz.

Grounding the unit is compulsory!

The motor is self-protected against overloading. It is thus NOT necessary to install an electrical overload protection device. See section 3.2 for detailed wiring instructions.

Insulation class
Fans / unit: IP 44
RC TAC4 REC: IP 20
Nominal temperatures: -10 °C / + 55° C
Conformity: CE (motors are also UL approved).

Before starting the unit

- If the fan wheel is rotating properly, without resistance?
- Verify if the installation and the connections are made according to the applicable European standards.
- Are the precautionary measures to avoid an accident taken? (Wiring, rotating parts, security measures,)

Operating conditions

The temperature over the fan motor cannot be lower than -10°C, or superior to 55°C. The unit is not designed to operate in an aggressive or an explosive environment. It is strongly not advised to stop and start the unit more often than every 5 minutes.

2.3 About the counterflow AIR/AIR heat exchanger

Protect the heat exchanger by regularly cleaning or replacing the filters.
To protect from frosting, the TAC4 DG control is as standard delivered with an inbuilt heat exchanger antifreeze system (by unbalancing the in and out airflows). There is also the KWin pre-heater option available to accomplish this if deemed necessary.
The maxi flat units are specified not to exceed a frontal air speed on the heat exchanger of 2,2 m/s.

2.4 Filters

Maxi flat units are delivered with G4 filters for the air ‘out’ flow and F7 filters for the air ‘in’ flow. Filters are the protectors of the heat exchanger, but also of the quality of the air you breathe.

2.5 Installation control datasheet (see appendix)

When the installation is completed and running, we strongly advise that the installer fills in the installation datasheet recapitulating all the data useful for maintenance of the installation. Please keep a copy of this datasheet closely as it may come handy for many reasons:

- make a clear communication in case of discussion with the manufacturer
- information if you need to change parameters when necessary
- this document can become an important factor in case of guarantee issues.

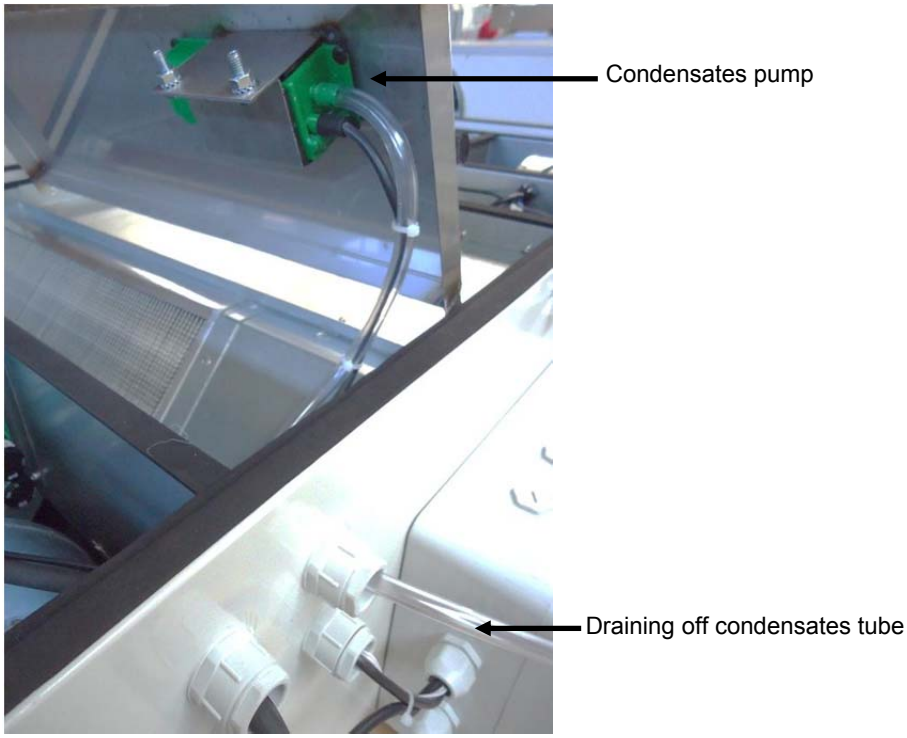
3 INSTALLATION INSTRUCTIONS

3.1 Installing the unit

- Make sure the unit is installed horizontally
- Leave sufficient access to the unit. Make sure it is possible to access to all the components for maintenance: fans, controls and filters.
- Special care has been taken to deliver an airtight unit. Make sure the ductwork is also very airtight, especially at the connections with the unit on the supply air side.

3.2 Connecting the drain pan

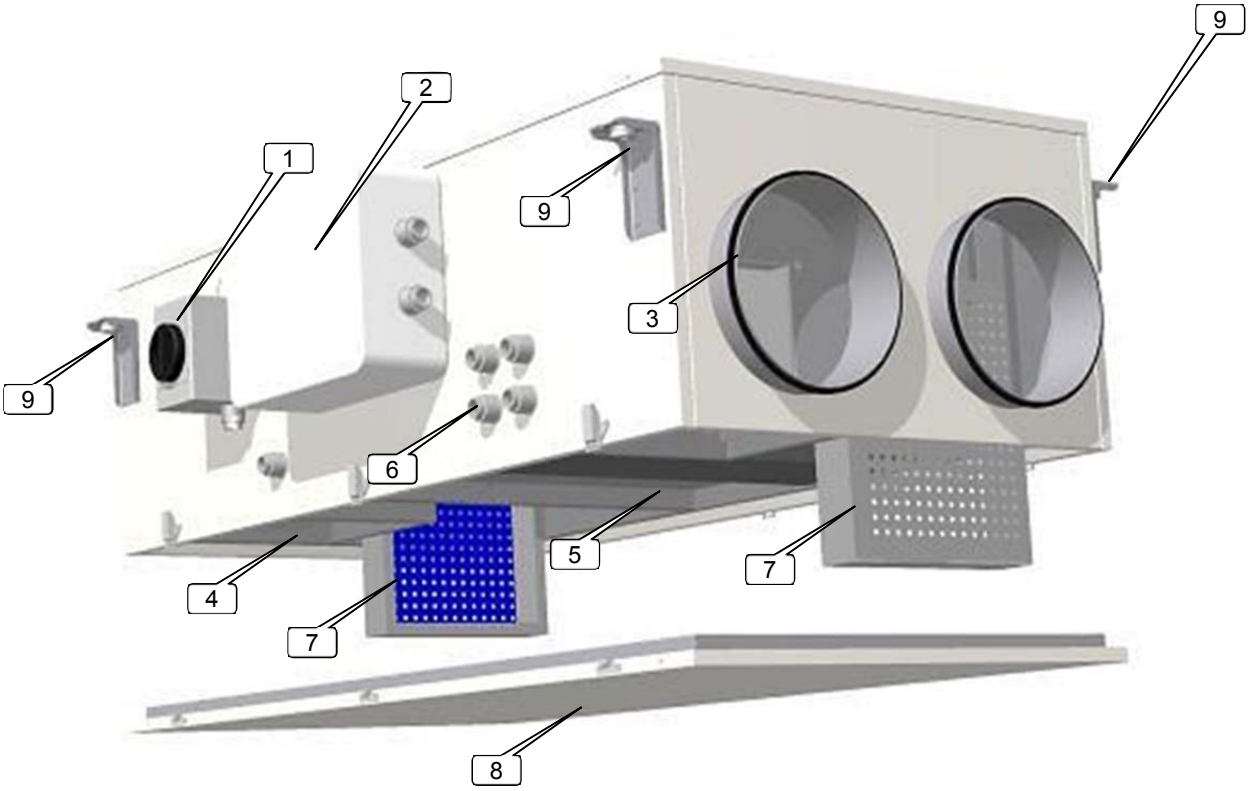
The maxi flat is delivered with a condensates pump (mounted and wired in our production). Connect the draining off condensates tube properly.



4 WIRING INSTRUCTIONS

4.1 General information

4.1.1 Schematic of the maxi flat units

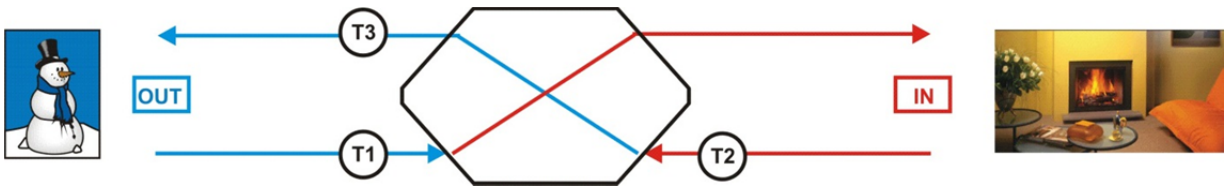


Picture: maxi flat 450

1 Main switch for power supply fans and control
2 Centralized wiring box of the CB4 TAC4 DL circuit (factory pre-wired)
3 Supply fan (right version maxi flat 450)
4 Exhaust fan (right version maxi flat 450)
5 Air/Air heat exchanger + By-pass 100%
6 Condensates tube
7 Filters
8 Access panel

Only electrical connections made by the installer are in 1/2/3.

4.1.2 Schematic of the T° sensors positioning in the maxi flat unit



To allow easier identification of the temperature sensors 3 different wire colors are used:

- T1 : black wire
- T2 : white wire
- T3 : blue wire

4.2 Power supply to the fans and the control devices

All the internal cables (fans, controls, sensors, …) to the main switch are factory pre-wired. All the power supply wiring that remains is the main power supply to the main switch(es).

Wiring specifications:

Unit type	Supply Voltage (1)	Maximum amps (2)	Protection type (3)	Protection caliber
maxi flat 450	1 x 230 V	2 x 1,5 A	D – 10.000A – AC3	8 A
maxi flat 450+KWin	1 x 230 V	2 x 1,5 A + 3,8 A	D – 10.000A – AC3	8 A
maxi flat 600	1 x 230 V	2 x 1,5 A	D – 10.000A – AC3	8 A
maxi flat 600+KWin	1 x 230 V	2 x 1,5 A + 5 A	D – 10.000A – AC3	16 A
maxi flat 1000	1 x 230 V	2 x 3,1 A	D – 10.000A – AC3	8 A
maxi flat 1000+KWin	1 x 230 V	2 x 3,1 A + 7,5 A	D – 10.000A – AC3	16 A
maxi flat 1600	1 x 230 V	2 x 4,6 A	D – 10.000A – AC3	16 A
maxi flat 1600+KWin	1 x 230 V	2 x 4,6 A + 8,7 A	D – 10.000A – AC3	20 A
maxi flat 2000	1 x 230 V	2 x 5,6 A	D – 10.000A – AC3	16 A
maxi flat 2000+KWin	1 x 230 V	2 x 5,6 A + 8,7 A	D – 10.000A – AC3	20 A

(1) Grounding is compulsory
(2) For airflow range from minimum to nominal + 20%.
(3) D type “slow” reaction curves - shutoff power 10.000A - AC3.

5 TAC4 CONTROL SYSTEM

The TAC4 control device manages the following features :

- Fan airflow management (accurate knowledge of fan's working point)
- Management of time slots
- Automatic bypass control (freecooling)
- Heat exchanger anti-freeze protection control

The TAC4 control circuit is factory pre-wired.

There are 4 ways to 'communicate' with the TAC4 control :

- RC TAC4 (LCD remote control)
- GRC TAC4 (graphic touchscreen display, can control up 247 units)
- MODBUS RTU network (usually to connect to a BMS)
- MODBUS TCP/IP network for a webserver type application, also allows GPRS communication

The following options can be combined with TAC4 control :

- RC TAC4 Option : remote control to setup, control and visualize the parameters.
  Please refer to TAC4 DL – RC TAC4 installation and user's manual for detailed information

- GRC TAC4 Option : graphic remote touchscreen to setup, control and visualize the parameters.
  Please refer to TAC4 DL – GRC TAC4 installation and user's manual for detailed information

- SAT TAC4 BA/KW Option:
  regulation of 2 external heat exchangers (electrical/water,hot and/or cold)
  please refer to SAT TAC4 BA/KW installation and user's manual for detailed information

- The SAT3 Option is a Circuit with 2 relays (2 SAT3 can be plugged)
  - When plugged in position OR1/OR2: status of "Fan On" warning and of "Pressure alarm" warning

    and/or
  - When plugged in position OR3/OR4 : status of water coil option circulator and of «bypass»

  please refer to SAT3 installation and user's manual for detailed information

- SAT TAC4 MODBUS Option : MODBUS RTU communication
  please refer to SAT TAC4 MODBUS installation and user's manual for detailed information

- TCP/IP TAC4 MODULE Option:
  MODBUS TCP/IP communication.
  please refer to TAC4 DL - TCP/IP installation and user's manual for detailed information

- GPRS TAC4 MODULE Option:
  GPRS Communication. Please refer to TAC4 DL - GPRS installation and user's manual for detailed information

.

Each one of these communication configuration is fully described in a separate installation manual.

6 MAINTENANCE

Before handling and/or opening the access panels it is compulsory to shut down the power supply using the general switch located on the front panel. Iif options KWin and\or KWout are installed, then shut down the corresponding general switches.

Regular maintenance of the maxiflat unit is essential to guarantee a good operation of the device and a long life expectancy. The maintenance frequency will depend on the application and on the actual environment conditions but in a general way the following controls are advised:

6.1 Every 3 months

1. Check for any alarm indicated on the control device. In case of alarm refer to control manual.
2. Check the state of filter clogging. The control device allows to set a pre-defined 'filter clogging' threshold (refer to installation manual). If need be replace filters. Filters that are too clogged can generate the following problems:
   - Insufficient ventilation
   - Excessive increase of fan rotation speed, creating excessive sound level
   - Excessive power consumption (power consumption will increase exponentially to an increase in pressure drop, for a constant airflow)
   - A damaged filter allows unfiltered air to enter heat exchanger (risk of clogging) and into ventilated room.

List of replacement filters:

Unit type	Filter „extract air“	Filter „intake air“
maxi flat 450	1 x G4 (245 x 295 x 50)	1 x G4 or 1 x F7 each (245 x 295 x 50)
maxi flat 600	1 x G4 (390 x 255 x 50)	1 x G4 or 1 x F7 each (390 x 255 x 50)
maxi flat 1000	1 x G4 (465 x 337 x 50)	1 x G4 or 1 x F7 each (465 x 337 x 50)
maxi flat 1600	1 x G4 (965 x 337 x 50)	1 x G4 or 1 x F7 each (965 x 337 x 50)
maxi flat 2000	1 x G4 (1250x337x50)	1 x G4 or 1 x F7 each (1250 x 337 x 50)

3. Inspection and cleaning of the inside of the unit:
   - Vacuum clean any accumulation of dust in the unit.
   - Inspect and gently vacuum clean if need be the heat exchanger. Use brush accessory to protect fins.
   - Clean the possible condensation marks and possible accumulations in the drain pan.

6.2 Every 12 months

1. Check for any alarm indicated on the control device. In case of alarm refer to installation manual.

2. Check the state of filter clogging. The control device allows to set a pre-defined 'filter clogging' threshold (refer to installation manual). If need be replace filters. Filters that are too clogged can generate the following problems:
   - Insufficient ventilation
   - Excessive increase of fan rotation speed, creating excessive sound level
   - Excessive power consumption (power consumption will increase exponentially to an increase in pressure drop, for a constant airflow)
   - A damaged filter allows unfiltered air to enter heat exchanger (risk of clogging) and into ventilated room.

   See above for list of replacement filters

3. Inspection and cleaning of the inside of the unit:
   - Vacuum clean any accumulation of dust in the unit.

- Inspect and gently vacuum clean if need be the heat exchanger. Use brush accessory to protect fins.
- Clean the possible condensation marks and possible accumulations in the drain pan.
- Clean drain pan
- Clean the inside of the bypass. To access interior of bypass it is necessary to force-open it, proceed as follows: jump terminals IN4 and +12V on the CB4 TAC4 DG circuit board. The bypass is now open, independently of temperature conditions.
- Remember to remove jump between terminals IN4 and +12V once cleaning of bypass is done.

4. Fan maintenance :
   Check again if power supply is shut down and fans are not running.
   Check cleanness of fan. Clean if necessary, be careful not to alter balancing of the fan wheel (do not remove balancing clips). Dismount fans if necessary.

5. Check airtightness of unit:
   Particularly check that side access panels are well closed and that airtightness seals are in a good state. Replace if necessary

Although we have created our documentation carefully, we accept no liability for errors and / or lack of information that might have crept in inadvertently.

Appendix 1: TAC4 DG: ADVANCED SETUP

Advanced Setup is used to enable certain specific features or to modify standard settings. The order of the table below corresponds to the sequence in the RC.

If TAC4 DG + RC regulation:
To start the advanced setup, press SETUP and ENTER simultaneously until 'ADVANCED SETUP' appears on the screen. Make selection via ↑ ↓ buttons, then press ENTER to confirm. Numbers are introduced digit by digit.

If TAC4 DG + GRC regulation:
Select 'Advanced Setup' on the GRC menu. CAUTION: some parameters considered as 'advanced' in the RC figure as 'standard' configuration of the GRC. In this case, "See setup" is mentioned in the table below, and consult MI TAC4 DG + GRC installation manual for configuration. Appendix 1 shows all the Advanced Setup screens, with a reference number. The table below refers to these numbers.

If TAC4 DG + MODBUS regulation:
For each feature of the advanced setup, the registry number is shown in the table. For more details see " TAC4 DG + MODBUS Installation Manual".

Function	Description	TAC4 DG + RC		TAC4 DG + GRC	TAC4 DG + MODBUS Register n°
		Step	Text on screen		
For all working modes (CA, LS, CPs)					
Password	If password access is enabled, enter here the access code to enter advanced setup configuration.	1 / 2	ENTRER ACCES CODE 0000	Will be requested to access advanced setup screens	40547
Modbus configuration	Enter MODBUS communication configuration mode ?	3 / 4	MODBUS CONFIG ? Y	/	/
Modbus Configuration	If yes, enter Modbus address of TAC4 unit	4.1	ADRESS : 001	Will be displayed on upper right corner of each screen	40543
Modbus Configuration	Select Baud rate : 1200-4800-9600-19200 Bauds	4.2	BAUD RATE 9600	/	/
Modbus Configuration	Select Parity: N (none) – E (even) – O (odd)	4.3	PARITY : N	/	/
RC takes back control of setup (after Modbus)	If setup and control features were made via Modbus communication, possibility here to switch control to an RC.	4.4	CONTROL BY RC ? Y	screen 8 (Set RC Master)	40200
If LS working mode					
Stop fans for certain 0-10V signal voltage values	Stop fans if actual 0-10V signal value < Vlow ?	5 / 6	STOP FAN IF V<Vlow? N	See setup screens MI TAC4 DG + GRC regulation	40501
Stop fans for certain 0-10V signal voltage values	Enter Vlow value to stop fans if actual 0-10V signal value < Vlow	6.1	Vlow : 00,0 V	See setup screens MI TAC4 DG + GRC regulation	40502
Stop fans for certain 0-10V signal voltage values	Stop fans if actual 0-10V signal value > Vsup ?	7 / 8	V>Vhigh? N	See setup screens MI TAC4 DG + GRC regulation	40503
Stop fans for certain 0-10V signal voltage values	Enter Vsup value to stop fans if actual 0-10V signal value > Vsup	8.1	Vhigh : 10,0 V	See setup screens MI TAC4 DG + GRC regulation	40504
Supply and Exhaust airflows independent from one another and linked to 2 different 0-10V signals	Possibility to drive separately exhaust and supply airflows. Supply airflow rate via a 0-10V signal connected to K2, and exhaust airflow rate via another 0-10V signal connected to K3. The link airflow rate/signal value must be the same.	9	0-10V on K3? N	See setup screens MI TAC4 DG + GRC regulation	40505
If CPs working mode					
Change Algorithm reaction speed	Configuration of the reaction speed of the CPs algorithm. 10 is Default value and is the highest reaction speed. Each -1 step corresponds to a doubling of the reaction time (10 = T, 9 = 2xT, 8 = 4xT,...). The default value is determined for most ducting application, only special applications (constant pressure in a room) require to change this parameter.	10	SPEED CPs? 10	Screen 1 (CPs speed)	40506
Change Algorithm reaction logic	Configuration of CPs mode operating logic: • Negative logic: - airflow rate drops when signal on K2 > assignment value - airflow rate rises when signal on K2 < assignment value • Positive Logic :: - airflow rate rises when signal on K2 > assignment value - airflow rate drops when signal on K2 < assignment value	11	LOGIC? NEGATIVE	Screen 1 (CPs Logic)	40507
If CA or LS working mode					
Stop fans when pressure alarm	Possibility to stop the fans in case of pressure alarm (after cancelling the alarm, press RESET to restart the fans..	12 / 13	PRESSURE ALARM STOP FAN? N	Screen 2 (Stop fans if alarm Pa ?)	40500
For all working modes (CA, LS, CPs)					
Change Starting Torque	Possibility to modify the fan's starting torque (2% default).	14 / 15	START TORQUE? 02%	Screen 1 (Start torque)	40508
Disable softstop function (via control device)	Disable the possibility to stop the fans using the RC (remote control) via K1/K2/K3 circuit TAC4 DG. This feature corresponds to disabling the softstop function: - If RC master: the OFF key is disabled. - If TAC4 DG master: -CA mode: if no entries connected to K1/K2/K3 then K1 airflow is activated. - LS or CPs Mode: if K1 entry not connected to +12V, then control will operate as if K1 was connected to +12V. To do this select N (O is default value)	16 / 17	FANS OFF Y	Screen 1 (Softstop allowed?)	40509

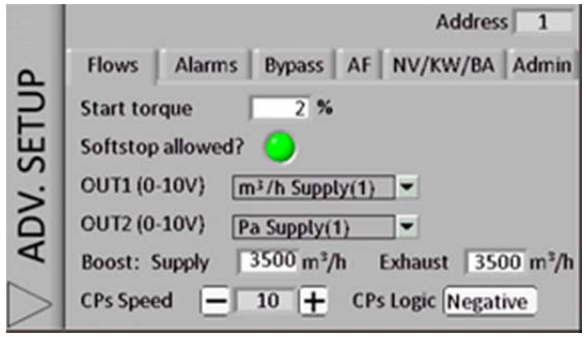
Boost function	Configure supply/exhaust airflow rate in case of activation of Boost feature ?	18	BOOST CONFIG ? N	/	/
Boost function	Enter supply airflow rate in case of activation of Boost feature ?	18.1	SUPPLY ? xxx m³h	Screen 1 (Boost : supply)	40548
Boost function	Enter exhaust airflow rate in case of activation of Boost feature ?	18.2	EXHAUST ? xxx m³h	Screen 1 (Boost : exhaust)	40549
Fire Alarm	Configure fire alarm operating mode ?.	19	FIRE AL CONFIG? N	/	/
Fire Alarm	Select how fire alarm is activated : entry IN3 is N.O or N.C (normally open or normally closed) NO : alarm is activated when in3 contact closed NC : alarm is activated when in3 contact is open	19.1	CONTACT IN3 ? N.O	Screen 2 (IN3 contact)	40510
Fire Alarm	Enter supply airflow rate when fire alarm is activated.	19.2	SUPPLY? 0000 m³h	Screen 2 (Supply)	40511
Fire Alarm	Enter exhaust airflow rate when fire alarm is activated.	19.3	EXTHAUST? 0000 m³h	Ecran 2 (Exhaust)	40512
Bypass control	Possibility to modify T° set points to control opening/closing the bypass. • Open by-pass if all following conditions are met : - Outdoor T° (S1) < indoor T° (S2). - Outdoor T° (S1) > T1. - Indoor T° (S2) > T2. • Closing by-pass if one of the conditions is met: - Outdoor T° (S1) > T° indoor (S2). - Outdoor T° (S1) < T1 - 1°C. - Indoor T° (S2) < T2 - 2°C.	20 / 21 / 22	BYPASS T VALUES : T1: 15° T2: 22°	Screen 3 (T1 and T2)	40513 40514
Bypass control	Enter supply and exhaust airflow rates when by-pass is open. If you select Y, then the airflows are independent from the airflows when bypass is closed (Closed bypass airflows are function of working mode, K1,K2,K3 status or Modbus commands).	23 / 24	SET m³h IF BYPASS OPEN? N	Screen 3 (set m³/h if the bypass is open ?)	40515
Bypass control	Enter supply airflow rate when by-pass open.	24.1	SUPPLY 0000m³h	Screen 3 (Supply)	40516
Bypass control	Enter exhaust airflow rate when by-pass open.	24.2	EXHAUST 0000m³h	Screen 3 (Exhaust)	40517
Antifrosting protection	If KWin option not installed: Possibility to enable (Y) or not (N) the heat exchanger's antifrost function by supply airflow rate reduction..	25	AF? Y	Screen 6 (AF protection active ?)	40519
Antifrosting protection	Possibility to modify the antifrost function parameters.	25.1	CONFIG AF? N	/	/
Antifrosting protection	Enter low T° value for antifrost function.	25.1.1	T° LOW AF: 0°C	Screen 5 (T° Low AF)	40520
Antifrosting protection	Enter high T° value for antifrost function.	25.1.2	T° HIGH AF: 3°C	Screen 5 (T° High AF)	40521
Antifrosting protection	Possibility to stop the fans if supply air T°< T° LOW.	25.1.3	AF STOP FAN?Y	Screen 5 (Stop supply if T°<T° Low?)	40522
KWin	If KWin pre-heat coil present (option) : Enter Setpoint T° to start ant-frosting process.	26	KWin T° AF/+1,0°	Screen 4 (Setpoint KWin)	40518
KWin / KWout	If KWin or KWout option present, it is possible to modify the PID parameters. CAUTION : these modifications can be fatal and should only be carried out by qualified personnel.	27	CONFIG PID KW ? N	/	/

KWin	KWin : possibility to modify PID parameter (PB)	27.1	KWin PID PB=005	Screen 4 (Select PID KWin)	40523
KWin	KWin : possibility to modify PID parameter (Tr)	27.2	KWin PID Ti=030	Screen 4 (Select PID KWin)	40524
KWin	KWin : possibility to modify PID parameter (Td)	27.3	KWin PID Td=011	Screen 4 (Select PID KWin)	40525
KWout	KWout: possibility to modify PID parameter (PB)	27.4	KWoutPID PB=005	Screen 7 (Select PID KWout)	40527
KWout	KWout: possibility to modify PID parameter (Tr)	27.5	KWoutPID Ti=030	Screen 7 (Select PID KWout)	40528
KWout	KWout: possibility to modify PID parameter (Td)	27.6	KWoutPID Td=011	Screen 7 (Select PID KWout)	40529
NV	If NV option installed: Possibility to change the reaction speed configuration of the post heating algorithm (3 way valve regulation). Default value is '5' for a middle speed reaction time. Each step of -1 corresponds to a doubling of the reaction time ('5'=T, '4'=2xT, '3'=4xT, '2'=8xT, …). Each step of +1 corresponds to a halving of the reaction time ('5'=T, '6'=T/2, '7'=T/4, '8'=T/8, …). We recommend changing this value only if you experience T° stability problems in your application.	28	NV/BA SPEED 05	Screen 6 (NV speed)	40526
SAT BA	Possibility to modify the regulation parameters of the heat exchangers regulated by the SAT TAC4 BA/KW (option)	29	SAT BA ? NO	/	/
SAT BA	Select coil type(s) regulate by the SAT TAC4 BA/KW: BA+, BA-, BA+/-, BA+/BA-, KW or BA-/KW	29.1	TYPE BA ? KW/BA-	Screen 6 or 7 (Sat BA?)	40550
SAT BA	If BA+ option installed and regulated by SAT TAC4 BA/KW : Possibility to change the reaction speed configuration of the post heating algorithm (3 way valve regulation). Default value is '5' for a middle speed reaction time. Each step of -1 corresponds to a doubling of the reaction time ('5'=T, '4'=2xT, '3'=4xT, '2'=8xT, …). Each step of +1 corresponds to a halving of the reaction time ('5'=T, '6'=T/2, '7'=T/4, '8'=T/8, …). We recommend changing this value only if you experience T° stability problems in your application.	29.1.1	NV/BA SPEED 05	Screen 6 (BA+ speed)	40526
SAT BA	If BA- option installed and regulated by SAT TAC4 BA/KW : Possibility to change the reaction speed configuration of the post heating algorithm (3 way valve regulation). Default value is '5' for a middle speed reaction time. Each step of -1 corresponds to a doubling of the reaction time ('5'=T, '4'=2xT, '3'=4xT, '2'=8xT, …). Each step of +1 corresponds to a halving of the reaction time ('5'=T, '6'=T/2, '7'=T/4, '8'=T/8, …). We recommend changing this value only if you experience T° stability problems in your application.	29.1.2	BA- SPEED 05	Screen 6 (BA- speed)	40551
0-10V output signal	Choice of information delivered by 0-10V OUT1 output connection : airflow or pressure on one fan (default value is airflow on fan F1).	30	Out 1 Pa F1	Screen 1 (OUT1 (0-10V))	40530
0-10V output signal	Choice of information delivered by 0-10V OUT2 output connection : airflow or pressure on one fan (default value is pressure on fan F1).	31	Out 2 Pa F1	Screen 1 (OUT2 (0-10V))	40531
Post ventilation	Enable post-ventilation feature (allow fans to run during a certain amount of time after softstop is activated). Caution : if Preheat KWin and/or Post-heat KWout, and/or SAT BA/KW is installed, the post-ventilation feature is automatically enabled. It is then impossible to set it to 'NO'.	32	POST VENT? N	Screen 6 (Post-vent. ?)	40532
Post ventilation	Enter post-ventilation time (in seconds) Caution: if pre or post electrical heating (KWin / KWout / KWext), time must be of at least 90 seconds.	32.1	TIME PV 0090 sec	Screen 6 (Delay)	40533

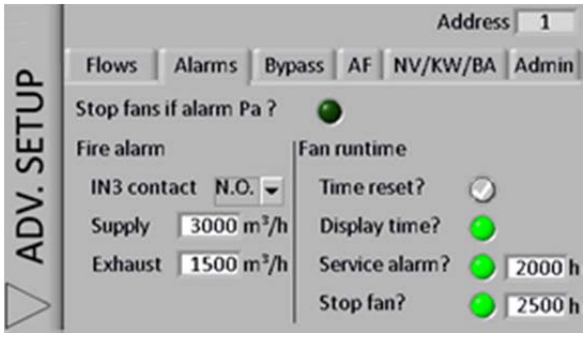
Operating time	**Possibility to enable a fan operating time counter feature. The purpose is to report an maintenance alarm and/or to stop the fans after a certain time of operation.**	**33**	**FAN RUN TIME? N**	**Enabled if one of the operating time features is enabled. (see hereunder / cfr screen 2)**	**40534**
Operating time	Reset operating time counter to 0	33.1	TIME RESET ? N	Screen 2 (time reset ?)	40252
Operating time	Enable display of operating time	33.2	DISPLAY TIME? N	Screen 2 (Display time ?)	40535
Operating time	Enable maintenance alarm after a certain operating time ?	33.3	SERVICE ALARM? N	Screen 2 (Service alarm ?)	40536
Operating time	Enter operating time limit (in hours) to generate a maintenance alarm.	33.3.1	TIME ? 000000 h	Screen 2 (xxxxh)	40537 40538
Operating time	Enable 'fan stop' alarm after a certain operating time ?	33.4	STOP FAN? N	Screen 2 (stop fan ?)	40539
Operating time	Enter operating time limit (in hours) to generate a 'fan stop' alarm. The fans will be stopped after this limit is passed.	33.4.1	TIME ? 000000 h	Screen 2 (xxxxh)	40540 40541
Operating time	Possibility to display only the alarms on the graphic screen. If no alarm is activated then "Vent OK" is displayed.	34	DISPLAY ALARM ONLY? N	/	40542
Access Code	Possibility to activate an access code to allow access to setup and advanced setup.	35	ACCESS CODE? N	Screen 8 (Access code ?)	40546
Access Code	Enter access code to setup and advanced setup (4 decimals).	35.1	CODE 0000	Screen 8 Possibility to configure 3 different access code levels : - Access to control level only - Access to control and setup only - Full access	40547
Full Reset	Possibility to operate a general factory reset. All factory settings are then regenerated.	36	FACTORY RESET? N		40251
	End of advanced setup	37	END SETUP		

Appendix 2: Advanced Setup screens on the GRC

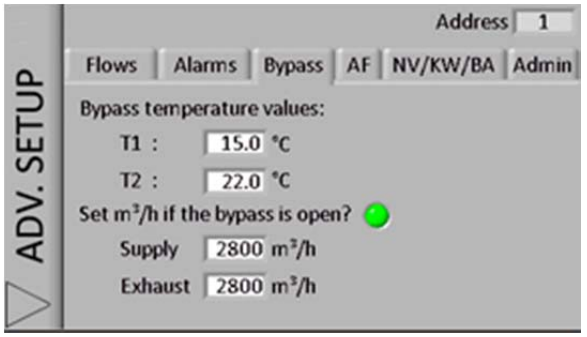
Screen 1



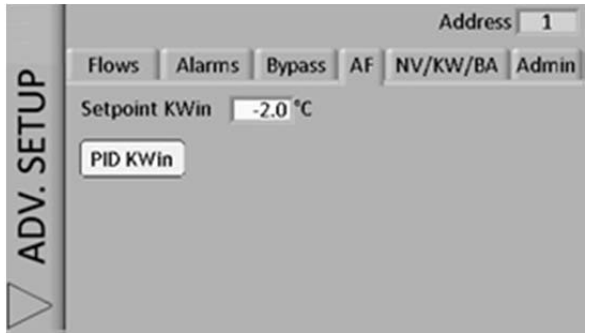
Screen 2



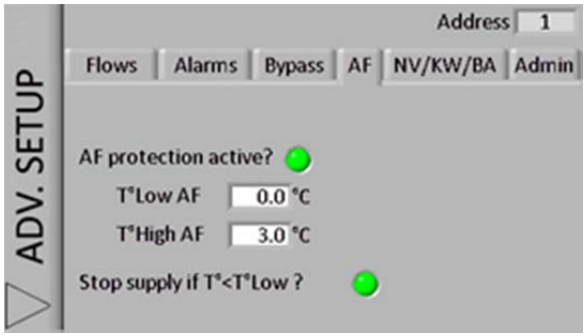
Screen 3



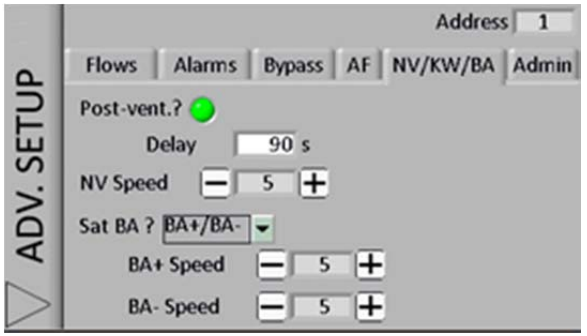
Screen 4



Screen 5

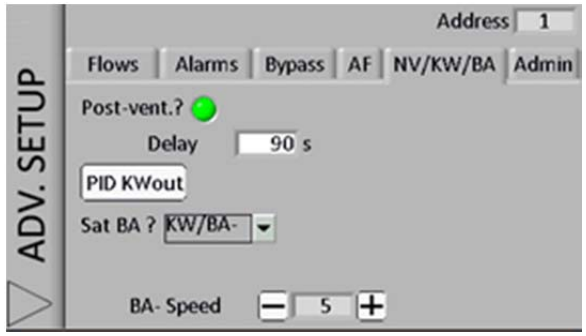


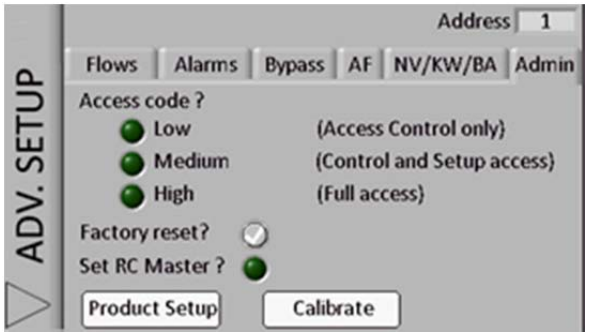
Screen 6



Screen 7

Screen 8


ADV. SETUP
Address 1
Flows
Alarms
Bypass
AF
NV/KW/BA
Admin
Post-vent.?
Delay
90 s
PID KWout
Sat BA ?
KW/BA-
BA- Speed
5


ADV. SETUP
Address 1
Flows
Alarms
Bypass
AF
NV/KW/BA
Admin
Access code ?
Low
(Access Control only)
Medium
(Control and Setup access)
High
(Full access)
Factory reset?
Set RC Master ?
Product Setup
Calibrate

Appendix 3: Installation control datasheet (to be filled in after starting the installation)

To facilitate future interventions in the scheme, please enter all made specific settings. Please have this document before contacting us. Without this document can help may not be possible.

Installed by: installation date: ___/___/___

Name: _____
Company: _____
Address: _____
Telephone:_____

CONFIGURATION PARAMETERS:

1	maxi flat model	
2	Working mode	CA LS CPs others
3	if CA mode:	m³h K1 = m³h K2 = m³h K3 =
4	if LS mode:	Vmin = Vmax = m³h≡Vmin = m³h≡Vmax = % on K3 =
5	if CPs mode:	Asignment Pa= V (oder Pa) % on K3 =
6	% EXT/PUL	%
7	Pressure alarm (modes CA / LS only)	Activated ? ja / nein If yes: Automatic / manual setup Initialisation: Supply air : m³h Pa Exhaust air : m³h Pa

Indicate here all changes made in the advanced setup, if any:

VALUES READ OFF DISPLAY WHEN MAXI flat in OPERATION:

1	Supply airflow	m³/h
2	Supply pressure	Pa
3	Exhaust airflow	m³/h
4	Exhaust pressure	Pa

Date: 26/08/2013

Subject to change in the interest of technical progress.

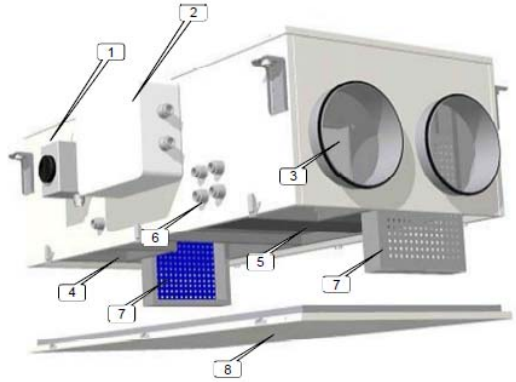
Technical Data

Mechanical Ventilation Heat Recovery Unit

maxi flat 450

PAUL WÄRMERÜCKGEWINNUNG

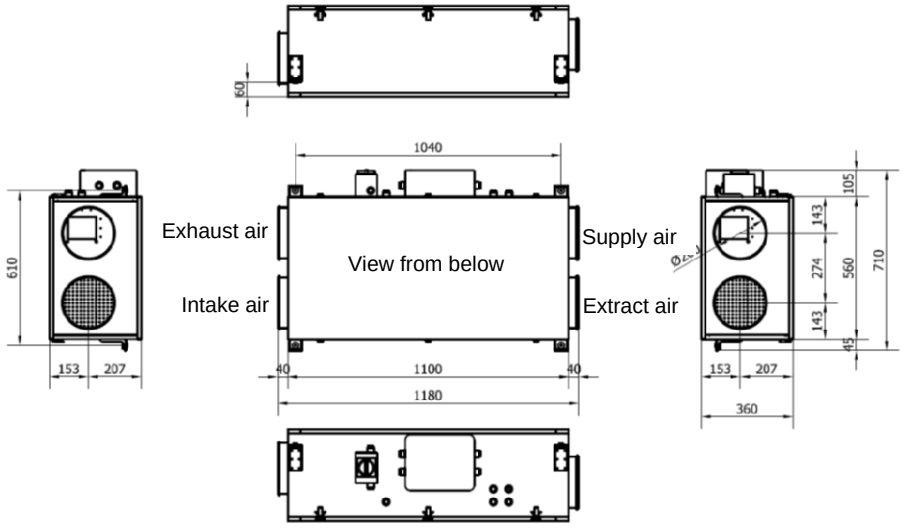
Unit design of the product line (fig. maxi flat 450):



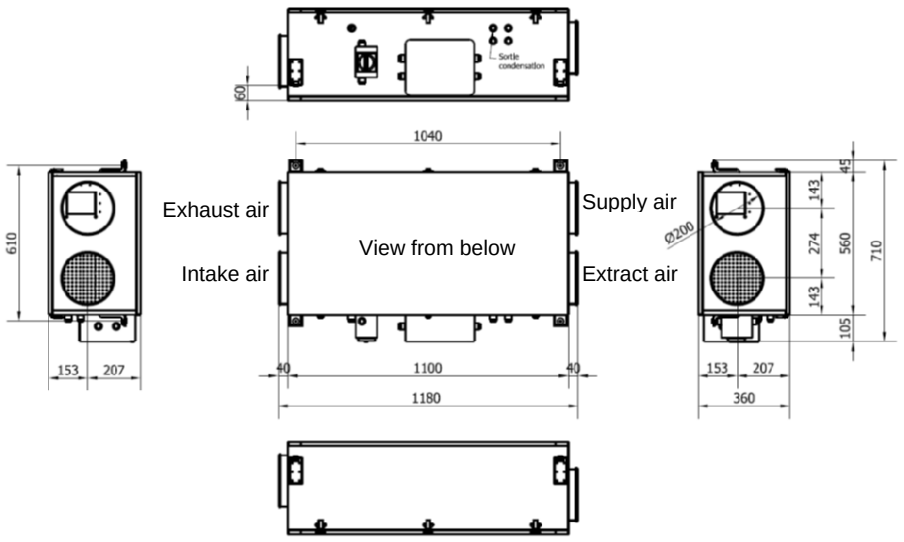
Product photo:

1 Main switch for power supply fans and control
2 Centralized wiring box of the CB4 TAC4 DG circuit (factory pre-wired)
3 Supply fan (right device design)
4 Exhaust fan (right device design)
5 Air/air – heat exchanger and bypass
6 Cable gland for performing condensate hose
7 Filter
8 Access door

Unit dimensions:



Right device design



Left device design

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Technical Spezification:	
Air flow:	50 – 450 m³/h
Demension (LxWxH)**:**	(1100 x 665 x 360) mm
Weight:	111 kg (Base unit without any additional components)
Duct connection:	DN 200
Electrical connection:	Fans and control devices: 1 x 230 V, 50/60 Hz; on main switch (pre-wired with centralized wiring box) Electric pre-heating, optionally: 1 x 230 V, 50/60 Hz; separate main switch (pre-wired with main switch)
Power input:	700 W (Base unit without any additional components)
IP Code (acc. to DIN 40050)**:**	IP 44 (Fany) IP 20 (RC TAC4 REC)
Operating range:	-20°C (lower value if option KWin) to +50°C
Heat exchanger:	Aluminum cross counterflow heat exchanger, sea water resistand
Fans:	EC direct current radial fans
Filter:	Filter G4 (Intake air and extract air), optional F7 (Intake air)
Housing:	Compact housing made of an anodised aluminium structure and acoustically and thermally insulated panels in painted steel on the outside (RAL9002) and galvanised steel inside.
Condensate drain:	Stainless steel drip pan, condensate pump and condensate hose ∅ 6 mm (1/4") ID
Summer operation:	motorized summer bypass, temperature-controlled, heat exchanger is 100% shut off

Operating Data:

air flow	Heat exchanger efficiency[1)]	Supply air temperature[1)] (after exchanger)	SFP	Power absorbed[2)]	Sound pessure level[2)] (open field in 3 m distance)
m³/h	%	°C	W/m³/h	W	dB(A)
100	95,6	20,6	0,08	8	11,7
200	93,4	19,9	0,21	42	22,6
300	92,1	19,5	0,38	114	29,5
450	90,7	19,0	0,73	330	36,4

[1)] Values for supply and extract air volume flow at t_{Au} = -10 °C, φ_{Au} = 90 % r.F. and t_{Ab} = 22 °C, φ_{Ab} = 50 % r.F.
[2)] at external pressure of 100 Pa

TAC4 control system:

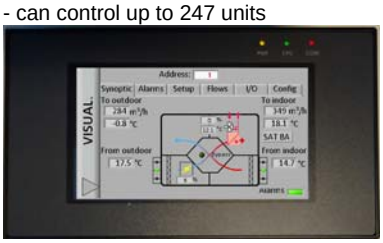
- Fan airflow management (accurate knowledge of fan's working point)
- Management of time slots depending from the control units
- Signaling/information for all alarms
- Fire alarm management
- Boost function
- Automatic bypass control (freecooling)
- Automatic opening and closing motrised dampers (option)
- Automatic anti-freeze protection of the counterflow
- Regulation of external post-heating/cold coil (option)
- Display of all the operating parameters
- Control and display systems via WEB pages (TCP/IP or GPRS modules)
- Networking units via MODBUS, KNX, or BAcnet communication

Control options / communications:

RC TAC4, Remote Control with LCD

Size: 122 x 66 mm
Cable to the control unit: IYSTY 2x2x0,6; max. 1000 m;
by costumer

GRCTAC4, Grafic Remote Control with touch display
- can control up to 247 units



Size: 152 x 87 mm
Cable to the control unit: IYSTY 2x2x0,6 with RS-232-connector; 3 m

TCP/IP TAC4 MODULE
This is a communication module in TCP/IP with built-in web server
This module can be combined with an RC but not with a GRC

GPRS TAC4 MODULE
This is a communication module in GPRS with built-in web server
This module can be combined with an RC but not with a GRC

SAT TAC4 MODBUS MODULE
MODBUS RTU communication circuit to be plugged in the TAC4 regulation circuit.

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Date: 26/08/2013

Subject to change in the interest of technical progress.

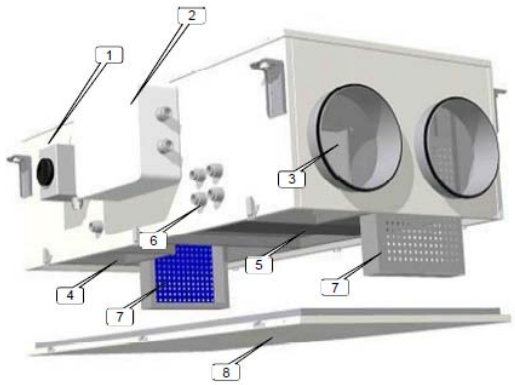
Technical Data

Mechanical Ventilation Heat Recovery Unit

maxi flat 600

PAUL WÄRMERÜCKGEWINNUNG

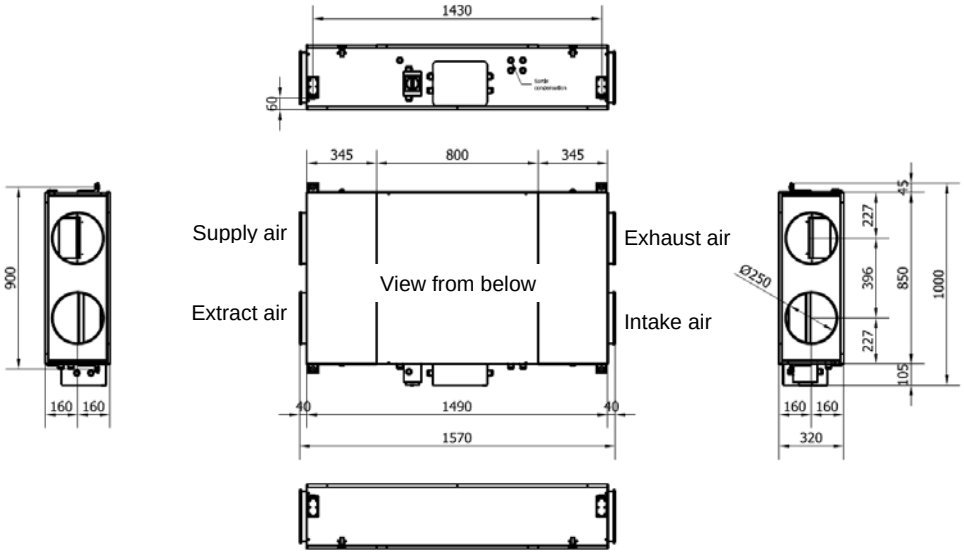
Unit design of the product line (fig. maxi flat 450):



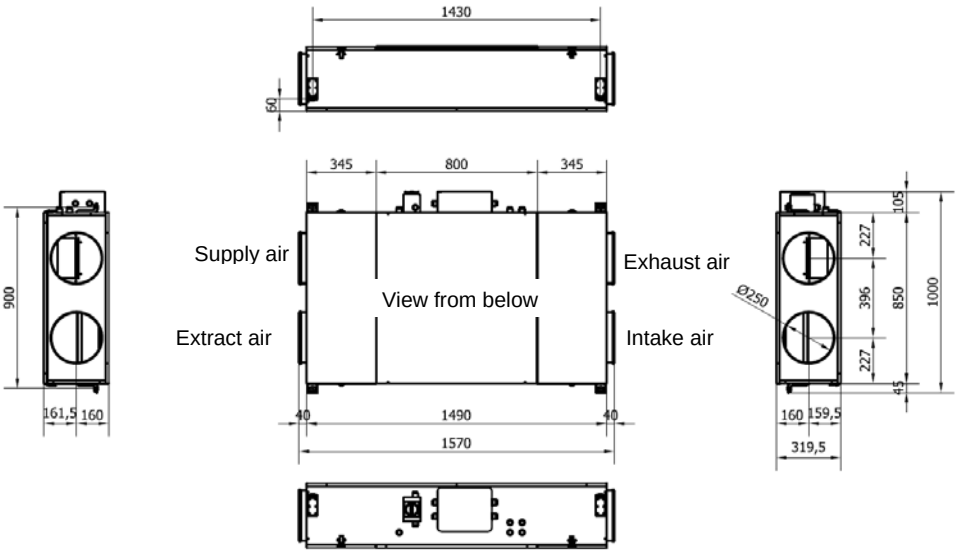
Product photo:

1 Main switch for power supply fans and control
2 Centralized wiring box of the CB4 TAC4 DG circuit (factory pre-wired)
3 Supply fan (right device design at maxi flat 450)
4 Exhaust fan (right device design at maxi flat 450)
5 Air/air – heat exchanger and bypass
6 Cable gland for performing condensate hose
7 Filter
8 Access door for each filter

Unit dimensions:



Right device design



Left device design

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Technical Spezification:	
Air flow:	50 – 600 m³/h
Demension (LxWxH)**:**	(1490 x 955 x 320) mm
Weight:	138 kg (Base unit without any additional components)
Duct connection:	DN 250
Electrical connection:	Fans and control devices: 1 x 230 V, 50/60 Hz; on main switch (pre-wired with centralized wiring box) Electric pre-heating, optionally: 1 x 230 V, 50/60 Hz; separate main switch (pre-wired with main switch)
Power input:	700 W (Base unit without any additional components)
IP Code (acc. to DIN 40050)**:**	IP 44 (Fany) IP 20 (RC TAC4 REC)
Operating range:	-20°C (lower value if option KWin) to +50°C
Heat exchanger:	Aluminum cross counterflow heat exchanger, sea water resistand
Fans:	EC direct current radial fans
Filter:	Filter G4 (Intake air and extract air), optional F7 (Intake air)
Housing:	Compact housing made of an anodised aluminium structure and acoustically and thermally insulated panels in painted steel on the outside (RAL9002) and galvanised steel inside.
Condensate drain:	Stainless steel drip pan, condensate pump and condensate hose ∅ 6 mm (1/4") ID
Summer operation:	motorized summer bypass, temperature-controlled, heat exchanger is 100% shut off

Operating Data:

air flow	Heat exchanger efficiency[1)]	Supply air temperature[1)] (after exchanger)	SFP	Power absorbed[2)]	Sound pessure level[2)] (open field in 3 m distance)
m³/h	%	°C	W/m³/h	W	dB(A)
150	95,3	20,5	0,08	12	13,8
300	93,1	19,8	0,20	60	25,3
450	91,8	19,4	0,34	153	32,2
600	90,8	19,1	0,52	310	37,2

[1)] Values for supply and extract air volume flow at t_{Au} = -10 °C, φ_{Au} = 90 % r.F. and t_{Ab} = 22 °C, φ_{Ab} = 50 % r.F.
[2)] at external pressure of 100 Pa

TAC4 control system:

- Fan airflow management (accurate knowledge of fan's working point)
- Management of time slots depending from the control units
- Signaling/information for all alarms
- Fire alarm management
- Boost function
- Automatic bypass control (freecooling)
- Automatic opening and closing motrised dampers (option)
- Automatic anti-freeze protection of the counterflow
- Regulation of external post-heating/cold coil (option)
- Display of all the operating parameters
- Control and display systems via WEB pages (TCP/IP or GPRS modules)

Networking units via MODBUS, KNX, or BAcnet communication

Control options / communications:

RC TAC4, Remote Control with LCD

Size: 122 x 66 mm
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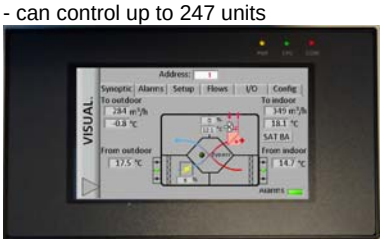

Size: 152 x 87 mm
Cable to the control unit: IYSTY 2x2x0,6 with RS-232-connector; 3 m

TCP/IP TAC4 MODULE
This is a communication module in TCP/IP with built-in web server
This module can be combined with an RC but not with a GRC

GPRS TAC4 MODULE
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Date: 26/08/2013

Subject to change in the interest of technical progress.

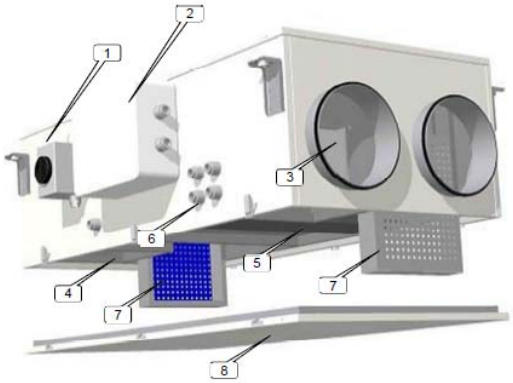
Technical Data

Mechanical Ventilation Heat Recovery Unit

maxi flat 1000

PAUL WÄRMERÜCKGEWINNUNG

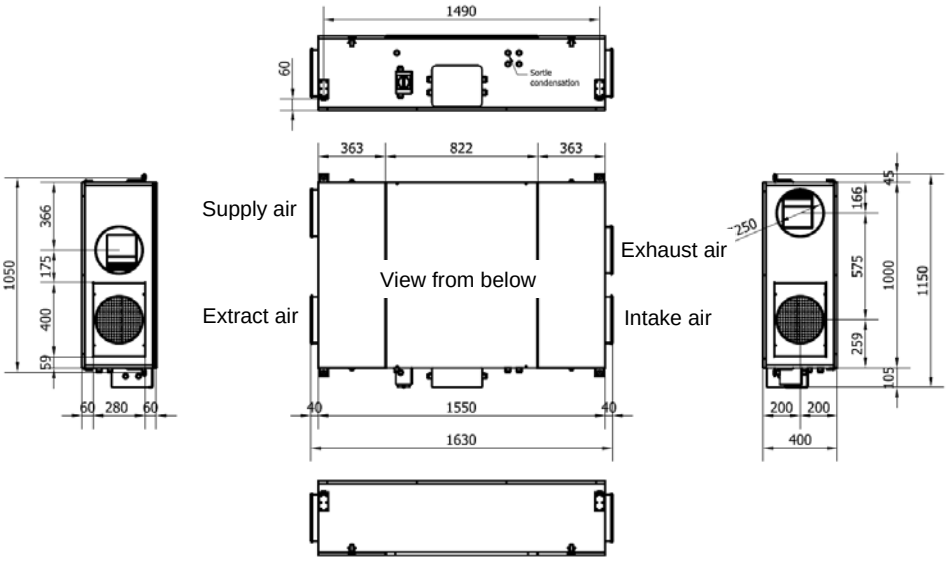
Unit design of the product line (fig. maxi flat 450):



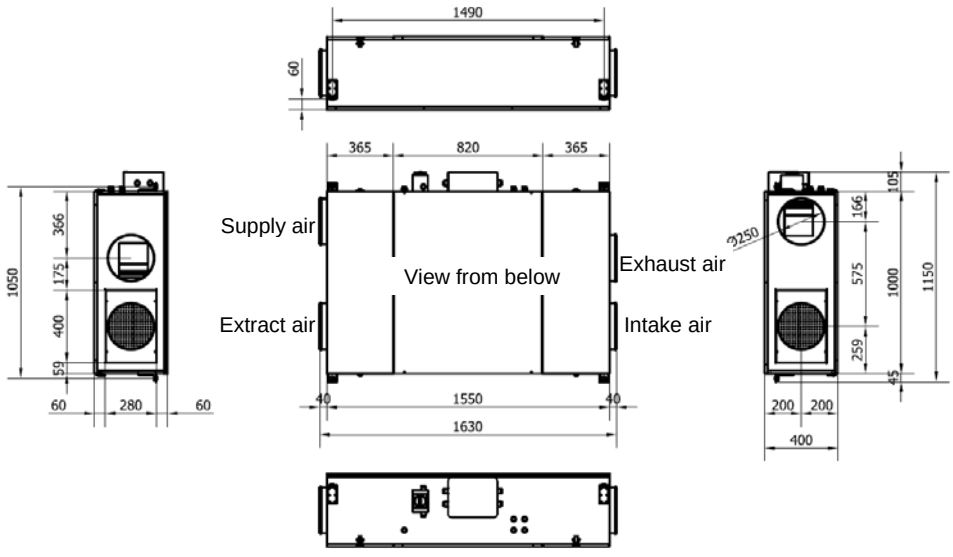
Product photo:

1 Main switch for power supply fans and control
2 Centralized wiring box of the CB4 TAC4 DG circuit (factory pre-wired)
3 Supply fan (right device design at maxi flat 450)
4 Exhaust fan (right device design at maxi flat 450)
5 Air/air – heat exchanger and bypass
6 Cable gland for performing condensate hose
7 Filter
8 Access door for each filter

Unit dimensions:



Right device design



Left device design

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Technical Spezification:	
Air flow:	100 –1000 m³/h
Demension (LxWxH)**:**	(1550 x 1105 x 400) mm
Weight:	172 kg (Base unit without any additional components)
Duct connection:	DN 250
Electrical connection:	Fans and control devices: 1 x 230 V, 50/60 Hz; on main switch (pre-wired with centralized wiring box) Electric pre-heating, optionally: 1 x 230 V, 50/60 Hz; separate main switch (pre-wired with main switch)
Power input:	1500 W (Base unit without any additional components)
IP Code (acc. to DIN 40050)**:**	IP 44 (Fany) IP 20 (RC TAC4 REC)
Operating range:	-20°C (lower value if option KWin) to +50°C
Heat exchanger:	Aluminum cross counterflow heat exchanger, sea water resistand
Fans:	EC direct current radial fans
Filter:	Filter G4 (Intake air and extract air), optional F7 (Intake air)
Housing:	Compact housing made of an anodised aluminium structure and acoustically and thermally insulated panels in painted steel on the outside (RAL9002) and galvanised steel inside.
Condensate drain:	Stainless steel drip pan, condensate pump and condensate hose ∅ 6 mm (1/4") ID
Summer operation:	motorized summer bypass, temperature-controlled, heat exchanger is 100% shut off

Operating Data:

air flow	Heat exchanger efficiency[1)]	Supply air temperature[1)] (after exchanger)	SFP	Power absorbed[2)]	Sound pessure level[2)] (open field in 3 m distance)
m³/h	**%**	**°C**	**W/m³/h**	**W**	**dB(A)**
250	95,5	20,6	0,08	21	16,8
500	93,4	19,9	0,20	100	27,8
750	92,1	19,5	0,36	273	34,7
1000	91,1	19,2	0,56	559	39,6

[1)] Values for supply and extract air volume flow at t_{Au} = -10 °C, φ_{Au} = 90 % r.F. and t_{Ab} = 22 °C, φ_{Ab} = 50 % r.F.
[2)] at external pressure of 100 Pa

TAC4 control system:

- Fan airflow management (accurate knowledge of fan's working point)
- Management of time slots depending from the control units
- Signaling/information for all alarms
- Fire alarm management
- Boost function
- Automatic bypass control (freecooling)
- Automatic opening and closing motrised dampers (option)
- Automatic anti-freeze protection of the counterflow
- Regulation of external post-heating/cold coil (option)
- Display of all the operating parameters
- Control and display systems via WEB pages (TCP/IP or GPRS modules)

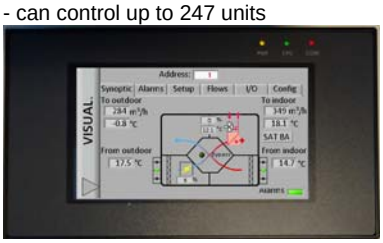
Networking units via MODBUS, KNX, or BAcnet communication

Control options / communications:

RC TAC4, Remote Control with LCD

Size: 122 x 66 mm
Cable to the control unit: IYSTY 2x2x0,6; max. 1000 m;
by costumer

GRCTAC4, Grafic Remote Control with touch display
- can control up to 247 units



Size: 152 x 87 mm
Cable to the control unit: IYSTY 2x2x0,6 with RS-232-connector; 3 m

TCP/IP TAC4 MODULE
This is a communication module in TCP/IP with built-in web server
This module can be combined with an RC but not with a GRC

GPRS TAC4 MODULE
This is a communication module in GPRS with built-in web server
This module can be combined with an RC but not with a GRC

SAT TAC4 MODBUS MODULE
MODBUS RTU communication circuit to be plugged in the TAC4 regulation circuit.

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Date: 26/08/2013

Subject to change in the interest of technical progress.

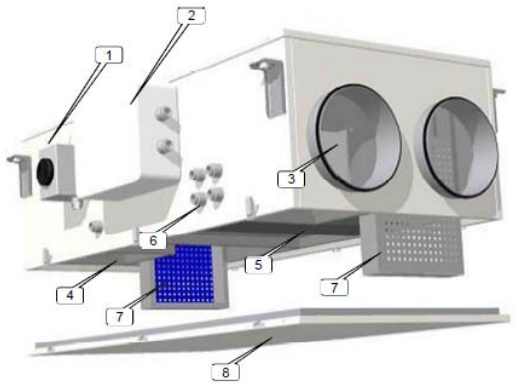
Technical Data

Mechanical Ventilation Heat Recovery Unit

maxi flat 1600

PAUL WÄRMERÜCKGEWINNUNG

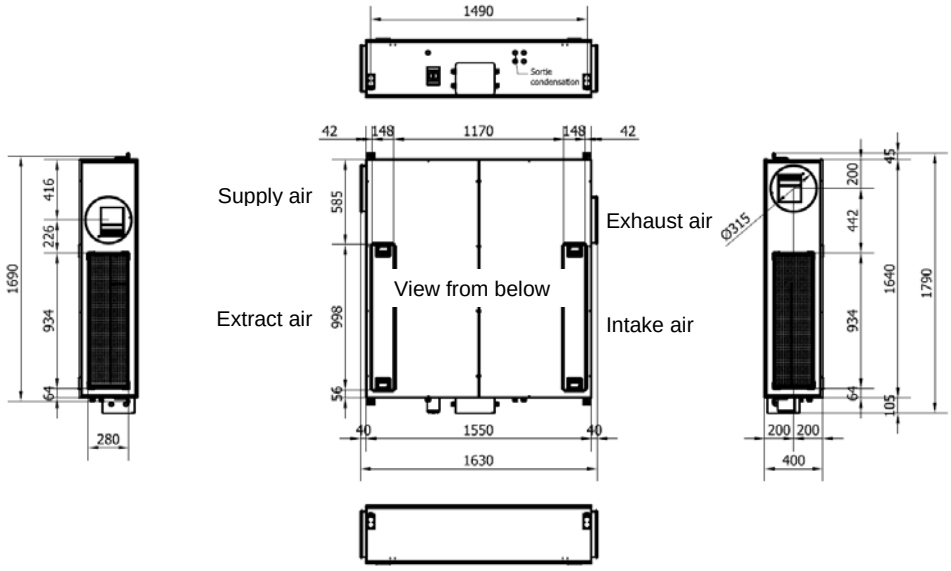
Unit design of the product line (fig. maxi flat 450):



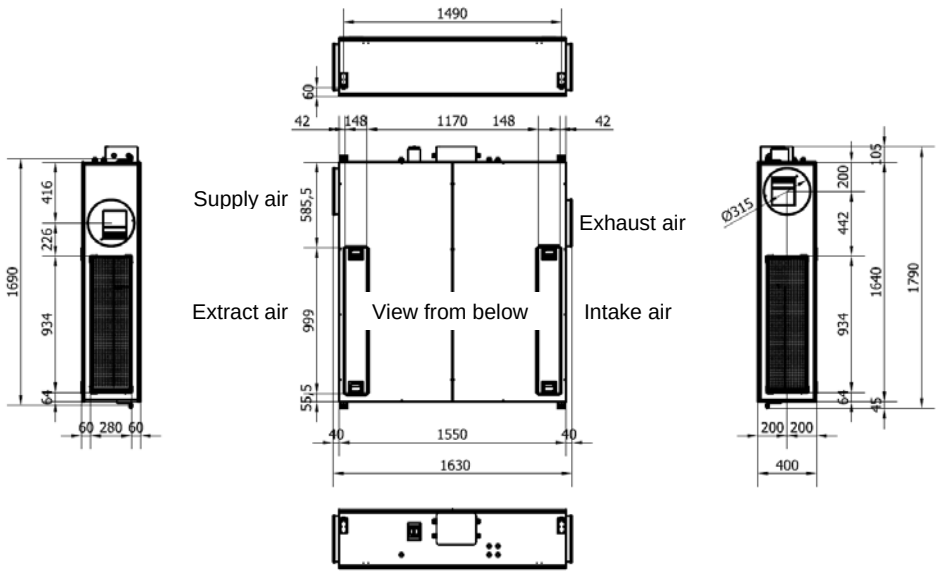
Product photo:

1 Main switch for power supply fans and control
2 Centralized wiring box of the CB4 TAC4 DG circuit (factory pre-wired)
3 Supply fan (right device design at maxi flat 450)
4 Exhaust fan (right device design at maxi flat 450)
5 Air/air – heat exchanger and bypass
6 Cable gland for performing condensate hose
7 Filter
8 Access door for each filter

Unit dimensions:



Right device design



Left device design

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Technical Spezification:	
Air flow:	100 –1600 m³/h
Demension (LxWxH)**:**	(1550 x 1745 x 400) mm
Weight:	247 kg (Base unit without any additional components)
Duct connection:	DN 315 Supply air and exhaust air, Rectangle duct (934 x 280) mm Intake air and extract air
Electrical connection:	Fans and control devices: 1 x 230 V, 50/60 Hz; on main switch (pre-wired with centralized wiring box) Electric pre-heating, optionally: 3 x 400 V +N, 50/60 Hz;; separate main switch (pre-wired with main switch)
Power input:	2200 W (Base unit without any additional components)
IP Code (acc. to DIN 40050)**:**	IP 44 (Fany) IP 20 (RC TAC4 REC)
Operating range:	-20°C (lower value if option KWin) to +50°C
Heat exchanger:	Aluminum cross counterflow heat exchanger, sea water resistand
Fans:	EC direct current radial fans
Filter:	Filter G4 (Intake air and extract air), optional F7 (Intake air)
Housing:	Compact housing made of an anodised aluminium structure and acoustically and thermally insulated panels in painted steel on the outside (RAL9002) and galvanised steel inside.
Condensate drain:	Stainless steel drip pan, condensate pump and condensate hose ∅ 6 mm (1/4") ID
Summer operation:	motorized summer bypass, temperature-controlled, heat exchanger is 100% shut off

Operating Data:

air flow	Heat exchanger efficiency[1)]	Supply air temperature[1)] (after exchanger)	SFP	Power absorbed[2)]	Sound pessure level[2)] (open field in 3 m distance)
m³/h	%	°C	W/m³/h	W	dB(A)
400	95,5	20,6	0,07	27	18,1
800	93,4	19,9	0,19	151	31,2
1200	92,1	19,5	0,37	442	40,6
1600	91,1	19,2	0,59	559	47,3

[1)] Values for supply and extract air volume flow at t_{Au} = -10 °C, φ_{Au} = 90 % r.F. and t_{Ab} = 22 °C, φ_{Ab} = 50 % r.F.
[2)] at external pressure of 100 Pa

TAC4 control system:

- Fan airflow management (accurate knowledge of fan's working point)
- Management of time slots depending from the control units
- Signaling/information for all alarms
- Fire alarm management
- Boost function
- Automatic bypass control (freecooling)
- Automatic opening and closing motrised dampers (option)
- Automatic anti-freeze protection of the counterflow
- Regulation of external post-heating/cold coil (option)
- Display of all the operating parameters
- Control and display systems via WEB pages (TCP/IP or GPRS modules)
- Networking units via MODBUS, KNX, or BAcnet communication

Control options / communications:

RC TAC4, Remote Control with LCD

Size: 122 x 66 mm
Cable to the control unit: IYSTY 2x2x0,6; max. 1000 m;
by costumer

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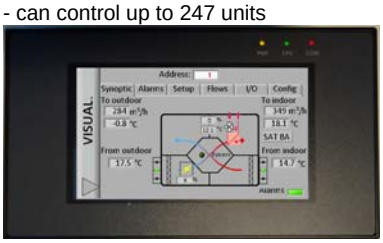

Size: 152 x 87 mm
Cable to the control unit: IYSTY 2x2x0,6 with RS-232-connector; 3 m

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Date: 26/08/2013

Subject to change in the interest of technical progress.

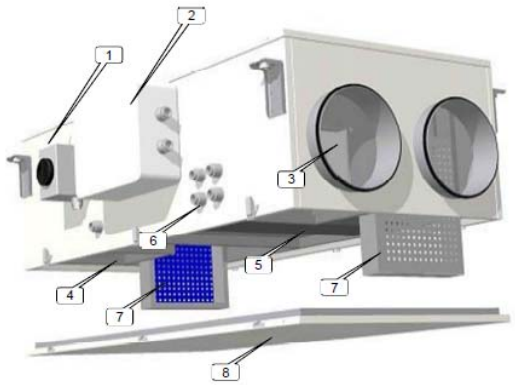
Technical Data

Mechanical Ventilation Heat Recovery Unit

maxi flat 2000

PAUL WÄRMERÜCKGEWINNUNG

Unit design of the product line (fig. maxi flat 450):



Product photo:

1 Main switch for power supply fans and control
2 Centralized wiring box of the CB4 TAC4 DG circuit (factory pre-wired)
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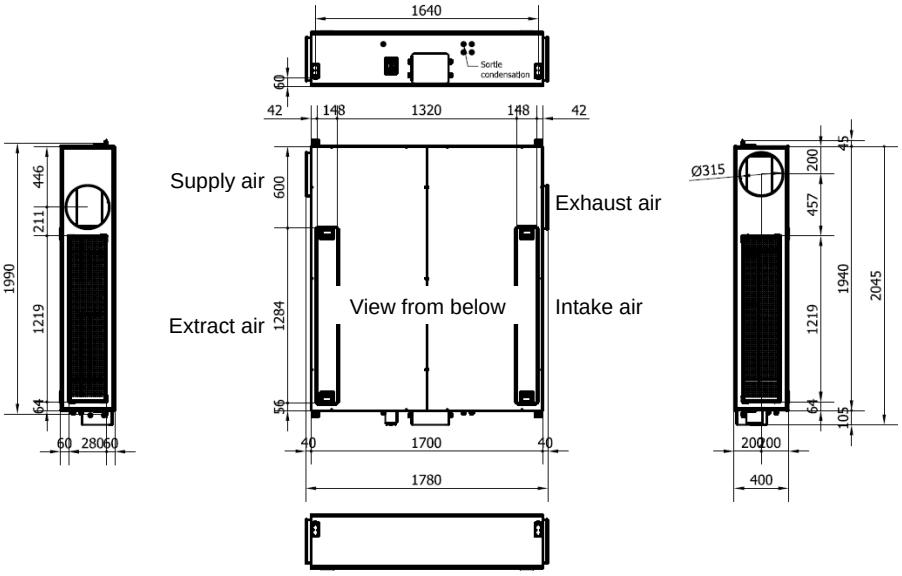
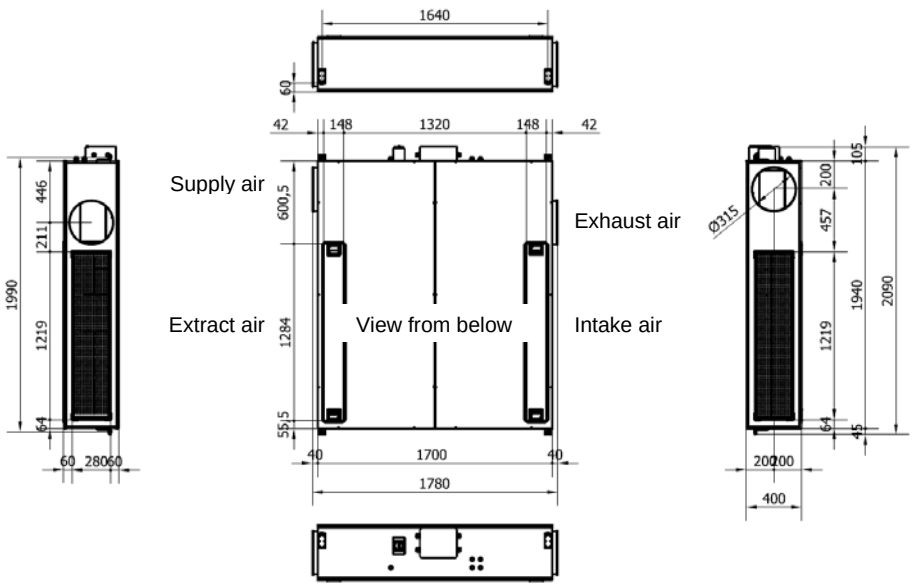
7 Filter
8 Access door for each filter

Unit dimensions:



Right device design



Left device design

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Technical Spezification:	
Air flow:	100 –2000 m³/h
Demension (LxWxH)**:**	(1700 x 2045 x 400) mm
Weight:	302 kg (Base unit without any additional components)
Duct connection:	DN 315 Supply air and exhaust air, Rectangle duct (1219 x 280) mm Intake air and extract air
Electrical connection:	Fans and control devices: 1 x 230 V, 50/60 Hz; on main switch (pre-wired with centralized wiring box) Electric pre-heating, optionally: 3 x 400 V +N, 50/60 Hz;; separate main switch (pre-wired with main switch)
Power input:	2200 W (Base unit without any additional components)
IP Code (acc. to DIN 40050)**:**	IP 44 (Fany) IP 20 (RC TAC4 REC)
Operating range:	-20°C (lower value if option KWin) to +50°C
Heat exchanger:	Aluminum cross counterflow heat exchanger, sea water resistand
Fans:	EC direct current radial fans
Filter:	Filter G4 (Intake air and extract air), optional F7 (Intake air)
Housing:	Compact housing made of an anodised aluminium structure and acoustically and thermally insulated panels in painted steel on the outside (RAL9002) and galvanised steel inside.
Condensate drain:	Stainless steel drip pan, condensate pump and condensate hose ∅ 6 mm (1/4") ID
Summer operation:	motorized summer bypass, temperature-controlled, heat exchanger is 100% shut off

Operating Data:

air flow	Heat exchanger efficiency[1)]	Supply air temperature[1)] (after exchanger)	SFP	Power absorbed[2)]	Sound pessure level[2)] (open field in 3 m distance)
m³/h	%	°C	W/m³/h	W	dB(A)
500	95,5	20,6	0,08	40	19,8
1000	93,4	19,9	0,21	213	30,9
1500	92,1	19,5	0,40	606	38,5
2000	91,1	19,2	0,65	1293	44,6

[1)] Values for supply and extract air volume flow at t_{Au} = -10 °C, φ_{Au} = 90 % r.F. and t_{Ab} = 22 °C, φ_{Ab} = 50 % r.F.
[2)] at external pressure of 100 Pa

TAC4 control system:

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- Management of time slots depending from the control units
- Signaling/information for all alarms
- Fire alarm management
- Boost function
- Automatic bypass control (freecooling)
- Automatic opening and closing motrised dampers (option)
- Automatic anti-freeze protection of the counterflow
- Regulation of external post-heating/cold coil (option)
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Networking units via MODBUS, KNX, or BAcnet communication

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RC TAC4, Remote Control with LCD

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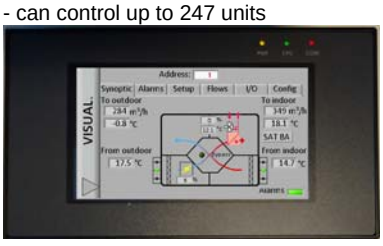

Size: 152 x 87 mm
Cable to the control unit: IYSTY 2x2x0,6 with RS-232-connector; 3 m

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Date: 11/07/13 Subject to change in the interest of technical progress.	**Checklist A** **Maintenance by customer**	PAUL WÄRMERÜCKGEWINNUNG

Maintenance Work	Enter date in the quarter			
1. Change both filters in the MVHR unit (change every 90 days)				
Quarter / Year	**I**	**II**	**III**	**IV**
201...				
201...				
201...				
201...				
201...				
201...				
201...				
202...				
202...				
202...				
2. Clean extract air prefilter / filter in extract air valves (change approx. every 2 months)				
Quarter / Year	**I**	**II**	**III**	**IV**
201...				
201...				
201...				
201...				
201...				
201...				
201...				
202...				
202...				
202...				
3. Change other filters in the system (outdoor air intake - also at ground heat exchanger) – all 6-12 months)				
Quarter / Year	**I**	**II**	**III**	**IV**
201...				
201...				
201...				
201...				
201...				
201...				
201...				
202...				
202...				
202...				

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Date: 11/07/13 Subject to change in the interest of technical progress.	**Checklist B** **Maintenance by skilled personnel**	PAUL WÄRMERÜCKGEWINNUNG

Maintenance

Enter result

- Inspection of MVHR unit based on DIN 1946-6
- Informal report for comments on MVHR unit's condition
- Use additional sheet of paper for adding reports of subsequent years

No.	Components	**Action / Interval** (yearly)	Result	201...	201...	201...	201...	201...
1	Fan / MVHR unit	Components cleaned? - fans - Heat exchanger - air-contacting surfaces of the device - preheater - condensate pan, siphon,	yes / no					
		Frost protection device functional?	yes / no					
		Structure-borne-noise transmission, fixings are avoided?	yes / no					
		Preheater / vaporizer / heat exchanger are not contaminated?	yes / no					
		Status indicators are working?	yes / no					
2	Condensate drain and siphon	Working?	yes / no					
		Condensate disposal OK?	yes / no					
3	Electronic controls	Cable connections and clamp fixing secure?	yes / no					
		Control units working?	yes / no					
4	Air ducts / heat insulation	Cleaning done (if required)? Test OK?	yes / no					
		Heat insulation and vapor barrier diffusion-close OK?	yes / no					
		Flexible connections between MVHR and air ducts OK?	yes / no					
5	Ground to air heat exchanger (if available)	Changeover working?	yes / no					
		Outdoor air intake free?	yes / no					
		Condition of prefilter OK?	yes / no					
		Condensate drain OK?	yes / no					
		Cleaning of the GHE (rinsing)	yes / no					
6	Fan / MVHR unit and fireplace operating mode (if available)	Safety device with firing installation working?	yes / no					
7	Fan / MVHR unit / other filters, filter condition	Filters of correct filter class installed?	yes / no					
8	Extract air / supply air outlet	Fit and lock OK?	yes / no					
		Filter condition OK?	yes / no					
		Air flow according air flow report OK?	yes / no					
9	Overflow air ducts	Free cross-section?	yes / no					
		No structure-borne / airborne noise transmission?	yes / no					

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Date: 23/08/2012 Subject to change in the interest of technical progress.	**Air Flow Report** **Operating condition, functional check[1)], instruction**	PAUL WÄRMERÜCKGEWINNUNG

Customer data		
Surname:	First name:	Tel:
Street:	ZIP:	Town:
Construction project:		

MVHR-type:	Serial-No.:	Built:

Measured data		
Measuring equipment used:	Fault descriptions during measurement:	Indoor temperature[2)]
		Outdoor temperature[2)]
		Weather[2)]

Filter condition on calibration	Supply	Extract air	Building moisture condition: ..... % RH without ventilation mode	Fan speed ratio Extract air / Supply air .....
clean				
used for approx. ... days				
very dirty				

Supply air				Ventilation step: %	
No.	Room description	Project data m³/h	Project data m³/s	Measured data m³/h	Measured data m³/s

Extract air				Ventilation step: %	
No.	Room description	Project data m³/h	Project data m³/s	Measured data m³/h	Measured data m³/s

Pel = W (2 fans)

[1)] The volumetric air flow is measured during normal MVHR operation 3) as agreed.
[2)] acc. to DIN EN 14134, Item 7.3.1.5.
[3)] acc. to DIN EN 14134, Item 7.4.1. b) end
[4)] acc. to DIN 1946-6 MVHR unit has to run continuously, except for times of maintenance or repair. Use lowest ventilation step or intermittent unoccopied program in times of absence.

- ⇨ The user has been instructed on the hygienic requirements [4)] for the operation of the MVHR unit
- ⇨ Customer has been advised that winter and summer operation influence the interior air humidity If too dry air (<30% RH → in winter) can create a moist heat exchanger transferring remedy - this can be supplied in many PAUL devices.
- ⇨ No parts other than genuine PAUL parts (e.g. filters) shall be used, otherwise the warranty will be void
- ⇨ The warranty period starts with delivery ex works

Date: ..... Signatures: .....
Startup personnel / Plumber User

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Date: 23/08/12 Subject to change in the interest of technical progress.	**Commissioning and handover certificate** **Completeness and performance verifications acc. to DIN 1946-6**	PAUL WÄRMERÜCKGEWINNUNG

Customer data		
Surname:	First name:	Tel:
Street:	ZIP:	Town:
Construction project:		

MVHR-type:	Serial-No.:	Built:

Completeness

No.	Device	Ausführung	Result
1	Supply air duct	- Version as planned - Cleaning possible	yes / no yes / no
2	Supply air outlets	- Configuration as planned - Version as planned - Cleaning possible - sufficient distance from the	yes / no yes / no yes / no yes / no
3	Overflow air outlets	- Configuration as planned - Version as planned	yes / no yes / no
4	Extract air outlets	- Configuration as planned - Version as planned - Cleaning possible - Pre-filter provided as planned?	yes / no yes / no yes / no yes / no
5	Extract air duct	- Cleaning possible	yes / no
6	Extract air fan	- Cleaning possible	yes / no
7	Control unit	- working?	yes / no
8	Filters, optional	- Possibility to change - or clean	yes / no
9	Heat exchanger for heat recovery	- Cleaning possible	yes / no
10	Extract air heat pump, optional	- Cleaning possible	yes / no
11	Condensate drain, optional	- working?	yes / no
12	Ground to air heat exchanger, optional	- Cleaning possible	yes / no
13	Duct heater, optional	- Cleaning possible	yes / no
14	Solar panel	- Cleaning possible	yes / no
15	Documentation / manual	- available	yes / no

Function

1	Ready to use in standard mode (nominal ventilation), as planned	Result OK further steps necessary	yes / no yes / no
2	Different modes possible, as planned	Result OK further steps necessary	yes / no yes / no
3	Power consumption	Result OK further steps necessary	yes / no yes / no

Confirmation

Date: ..... Signature/Stamp:.....
Startup personnel / Plumber

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Germany
Tel.: +49(0)375 - 303505 - 0
Fax: +49(0)375 - 303505 - 55

CE DECLARATION OF CONFORMITY

Product description: Mechanical ventilation heat recovery (MVHR) unit **maxi flat 450, maxi flat 650, maxi flat 1000 maxi flat 1600, maxi flat 2000,**

Complies the Directives:

Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC

Applied standards:

EN 61000-6-1 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments

EN 61000-6-3 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

EN 55011 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)

Applied standards:

EN ISO 12100-1 Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology

EN ISO 3744 Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane

EN ISO 5136 Acoustics - Determination of sound power radiated into a duct by fans and other air-moving devices - In-**duct method**

Directive 2006/42/EC of the European Parliament and of the Council of 12 December 2006 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

Applied standards:

EN 60730-1 Automatic electrical controls for household and similar use - Part 1: General requirements

EN 60730-2-15 Automatic electrical controls for household and similar use - Part 2-15: Particular requirements for automatic electrical air flow, water flow and water level sensing controls

Reinsdorf, 14th of February 2013
Paul Wärmerückgewinnung GmbH

Michael Pitsch
CEO